Doyletech Corporation

DOYLETECH

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Final Report

to

CANMET

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MICROMEDIA

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1. Introduction

The objective of this consulting assignment which covered the period from July 1991 through March 1992 was to assist CANMET in promoting the transfer of technology to the private sector for commercial exploitation. Some time was also to be spent in assisting the Interdepartment Group on Intellectual Property (the IP Group) in the identification and development of new tools for technology transfer.

The technique of using Business Opportunity Documents (BOD's) for transferring CANMET technology was to be further refined and approximately ten new BOD's were to be generated.

2. Interim Reports

Progress reports have been issued as follows:

July 31, 1991

- reported on visit to Coal Research Laboratory
- identified three BOD's
- delivered a workshop at CRL

October 31, 1991

- reported on 3 BOD's being worked on with Metals Technology Lab, and one with Mining Research Lab
- reported on meetings between Dr. E. Contestabile and FRE re Commercialization of mortar technology
- reported on assistance to IP Group

January 31, 1992

- reported on several BOD's in preparation at Energy Research Lab (Bill Dawson)
- reported on a project to document financial assistance programs applicable to CANMET technology
- reported on technology transfer tool box for IP Group

Copies of these reports are attached as Appendix I.

3. Activity Since Last Report

Most of the activity since the last report (January 31, 1992) has been focussed on the following:

- Further development of the ERL BOD's
- Meetings with IP Group (3 in total) and various discussions with K. Belinko
- Finalizing the "financing programs" document
- Discussions with Luc Lalande re BOD's and their delivery
- Workshop with CANMET managers to review progress of technology transfer activities generally

4. BOD's Delivered

While some of the ERL BOD's are still undergoing a review by key technical personnel, it is expected that fifteen (15) will be available for final editing by Luc Lalande of the Technology Marketing Division. The following is a listing of all BOD's that were either worked on or brought to a final product during this assignment.

1. Titration Software - Coal Research Laboratory - completed
2. Electrocoagulation System - Coal Research Laboratory - completed
3. De-inking of Newsprint - Coal Research Laboratory - work was done by both Doyletech and TMD in assessing the market for de-inking of newsprint, but a BOD was not finalized; CRL personnel did not provide the necessary technical information.
4. An instrument for measuring the compatibility of foundry sand - Metals Technology Lab - R. Warda
5. Powdered magnetic material - Metals Technology Lab - Dr. L. Collins
6. Hot-worked Iron - Rare Earth Permanent Magnets - Metals Technology Lab - Dr. L. Collins (MTL)
7. Borehole Strain Sensors - Dr. Gerhard Herget (MRL) - the purpose of this BOD was to present a case for CANMET supplying such units.

8. Solid phase super acid catalysts for polymerization and alkylation processes
9. Benzene removal from gasoline
10. Standard method of hydrocarbon analysis using gas chromatography
11. Characterization of fines in synthetic crude oil
12. A process for improving the quality of heavy oil (emulsion upgrading)
13. Adsorption/desorption process for synthetic gas oil
14. Determination of nitrogen components in synthetic gas oils
15. The characterization of de-activated hydroprocessing catalysts from synthetic and heavy crude oil upgrading

5. Assistance to IP Group

The discussions with the IP Group were related mostly to the structure and role of a proposed consortium that would take over the IP Group's activities as well as others related to improving the efficiency of government R&D and its impact on Canadian industry.

The advice given was to focus heavily on the acceleration of technology commercialization because of the current emphasis on industrial competitiveness. This led to a discussion of a model for measuring the economic payback from such commercialization. This is a well-discussed subject but one on which there is little consensus. The IP Group can play a valuable role in developing such a model. There seems to be some confusion on how to strike a balance between the following roles of a government laboratory:

- To meet the research and advisory needs of the SBDA
- To serve the laboratory's existing client base
- To act as a "technology engine" for the creation of new firms and new product lines in existing firms

6. Document on Financial Assistance Programs

A report entitled "Financial Assistance Programs Applicable to CANMET Technology" prepared by Paul Timmins of Doyletech dated January 1992 was delivered in early February. Unfortunately, it was not possible to provide current

information on the actual level of funding available in each of the programs. Such information is not readily available; this will be discussed further in the Summary and Recommendations section of this report.

7. Workshop with CANMET Managers

This workshop was held on March 16th. There was general agreement that the BOD concept that had been used by Doyletech in its work with CANMET since 1989 was useful and productive. BOD's had played a role in the commercialization of some technologies (e.g. ferric chloride) and had clarified both R&D and exploitation strategies on others.

It was recommended that it be continued and that scientists be given recognition for at least attempting to write BOD's, because as Bill Dawson pointed out, they do involve a lot of effort.

The workshop also addressed the issue of developing a suitable model for economic payback.

It was pointed out that BOD's are not intended specifically as cost recovery tools but that they could result in new business relationships that would provide cost recovery as well as ongoing technology relationships.

They also serve as screening tools in planning R&D projects.

8. Summary and Recommendations

The work on this contract has now been completed. A framework has been established for early identification of technology exploitation opportunities and for documenting them in such a way that they will attract the attention of potential industrial partners.

It is strongly recommended that the IP Group develop a model for measuring economic payback. The model presented at the March 16th CANMET workshop could provide a starting point. It focuses on the creation of new ventures but it

could be expanded to quantify the payback that existing clients might receive at some future date.

It is also recommended that a dynamic information system be set up to allow companies to determine the exact funding status of the various incentive programs at any point in time.

Appendix I

Interim Reports

CANMET Milestone Report

July 31, 1991

- A seminar and workshop was conducted at the Coal Research Lab in Devon, Alberta on July 3rd and 4th.
- It resulted in the generation of two Business Opportunity Documents:
  - Titration Software
  - Electrocoagulation System
- These have been sent to the scientists for review.
- A de-inking project was discussed with CRI scientists and some preliminary data was gathered on the current state of the art in de-inking of recycled paper.
- Further refinement on the Fibre Reinforced Epoxy Mortar BOD was done during June and is being used in negotiations with a consortium of potential exploiters.
- Three meetings were held with members of the interdepartmental IP Group to develop a generalized model for technology transfers out of government laboratories. Three "tool descriptions" were drawn up by Doyletech as follows:
  - Investment
  - Marketing
  - Technology brokering
- Priorities for next three months will be:
  a) development of additional BOD's (ten required in total).
  b) development of 3 new technology transfer tools for the IP committee.
  c) attendance at meetings of IP Group.

Report to

CANMET

October 31, 1991

The work performed on this project during this period (August, September, October and November) consisted of the following:

A. Preparation of Business Opportunity Documents

- An instrument for measuring the compactability of foundry sand - Metals Technology Lab - R Warda
- Powdered magnetic material - Metals Technology Lab - Dr. L. Collins
- Hot-worked Iron - Rare Earth Permanent Magnets - Metals Technology Lab - Dr. L. Collins (MTL)
- Borehole Strain Sensors - Dr.. Gerhard Herget (MRL) - the purpose of this BOD was to present a case for CANMET supplying such units.
- Dr. E. Contestabile - meetings with FRE representatives in September re BOD prepared in May

B. Assistance to I.P. Group on Tool Box Preparation

A total of 4.5 days was spent on matters related to the technology transfer tool box, including attendance at the workshop on November 12th. A draft introduction to the tool kit information price was also prepared. It requires more work. The following is a list of tools originated by Doyletech:

- Investment
- Marketing
- Technology Brokering
- Technology Networking
- Incentives for Scientists

Report to

CANMET

January 31, 1992

The work performed on this contract since the last milestone (November 30, 1991) consisted of the following:

1. Met with Bill Dawson of Energy Research Lab to discuss several business opportunity documents (see attached list). At least four will be produced as a result of this activity. Two are now complete and three others are being worked on, but all may not result in BOD's.

2. Held several discussions with Keith Belinko re technology transfer tool box and issues related to it. Provided him with an advance copy of a paper done for the Regional Municipality of Ottawa-Carleton which described some of the initiatives proposed at the tool box workshop on November 12. 1990.

3. Met with Dr. Gerhard Herget on January 22, 1992 to discuss his borehole strain gauge project. Provided advice on how to structure a working arrangement with a distributor.

4. Initiated a project to identify granting programs applicable to CANMET industrial partners. This project (which will involve about 8 days of a marketing assistant's time) is about half complete.

It is anticipated that a total of twelve BOD's will be produced. (Ten were called for in the contract.) A draft version of a final report will be available in mid-March.

List of ten BOD's being discussed with Bill Dawson.

1. Hydrogenation of aromatics in transportation fuels using metal cluster catalyst. (Has not been produced.)

2. Solid phase super acid catalysts for polymerization and alkylation processes.

3. Benzene removal from gasoline.

4. Standard method of hydrocarbon analysis using gas chromatography.

5. Characterization of lines in synthetic crude oil.

6. A process for improving the quality of heavy oil (emulsion upgrading).

7. Adsorption/desorption process for synthetic gas oil.

8. Determination of nitrogen components in synthetic gas oils.

9. The characterization of de-activated hydroprocessing catalysts from synthetic and heavy crude oil upgrading.